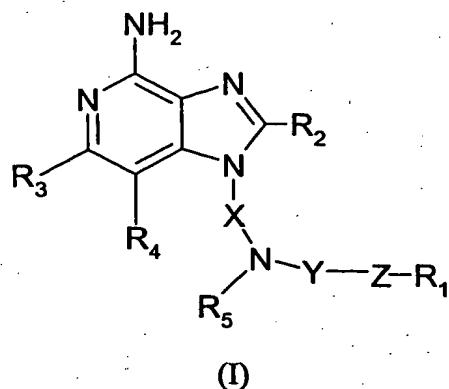


WHAT IS CLAIMED IS:

1. A compound of the formula (I):



wherein

X is alkylene or alkenylene;

Y is -CO- or -CS-;

10 Z is a bond, -O-, or -S-;

R<sub>1</sub> is aryl, heteroaryl, heterocyclyl, alkyl or  
alkenyl, each of which may be unsubstituted or substituted by one or more  
substituents independently selected from the group consisting of:

15 -alkyl;

-alkenyl;

-aryl;

-heteroaryl;

-heterocyclyl;

-substituted cycloalkyl;

20 -substituted aryl;

-substituted heteroaryl;

substituted heterocyclyl;

-O-alkyl;

-O-(alkyl)<sub>0-1</sub>-aryl;

25 -O-(alkyl)<sub>0-1</sub>-substituted aryl;

-O-(alkyl)<sub>0-1</sub>-heteroaryl;

-O-(alkyl)<sub>0-1</sub>-substituted heteroaryl;

- O-(alkyl)<sub>0-1</sub>-heterocyclyl;
  - O-(alkyl)<sub>0-1</sub>-substituted heterocyclyl;
  - COOH;
  - CO-O-alkyl;
  - 5 -CO-alkyl;
  - S(O)<sub>0-2</sub>-alkyl;
  - S(O)<sub>0-2</sub>-(alkyl)<sub>0-1</sub>-aryl;
  - S(O)<sub>0-2</sub>-(alkyl)<sub>0-1</sub>-substituted aryl;
  - S(O)<sub>0-2</sub>-(alkyl)<sub>0-1</sub>-heteroaryl;
  - 10 -S(O)<sub>0-2</sub>-(alkyl)<sub>0-1</sub>-substituted heteroaryl;
  - S(O)<sub>0-2</sub>-(alkyl)<sub>0-1</sub>-heterocyclyl;
  - S(O)<sub>0-2</sub>-(alkyl)<sub>0-1</sub>-substituted heterocyclyl;
  - 15 -(alkyl)<sub>0-1</sub>-N(R<sub>6</sub>)<sub>2</sub>;
  - (alkyl)<sub>0-1</sub>-NR<sub>6</sub>-CO-O-alkyl;
  - (alkyl)<sub>0-1</sub>-NR<sub>6</sub>-CO-alkyl;
  - (alkyl)<sub>0-1</sub>-NR<sub>6</sub>-CO-aryl;
  - (alkyl)<sub>0-1</sub>-NR<sub>6</sub>-CO-substituted aryl;
  - (alkyl)<sub>0-1</sub>-NR<sub>6</sub>-CO-heteroaryl;
  - 20 -(alkyl)<sub>0-1</sub>-NR<sub>6</sub>-CO-substituted heteroaryl;
  - N<sub>3</sub>;
  - halogen;
  - haloalkyl;
  - haloalkoxy;
  - CO-haloalkyl;
  - 25 -CO-haloalkoxy;
  - NO<sub>2</sub>;
  - CN;
  - OH;
  - SH; and in the case of alkyl, alkenyl, and heterocyclyl, oxo;
- 30

**R<sub>2</sub>** is selected from the group consisting of:

- hydrogen;

- alkyl;
  - alkenyl;
  - aryl;
  - substituted aryl;
  - 5 -heteroaryl;
  - substituted heteroaryl;
  - alkyl-O-alkyl;
  - alkyl-S-alkyl;
  - alkyl-O-aryl;
  - 10 -alkyl-S-aryl;
  - alkyl-O- alkenyl;
  - alkyl-S- alkenyl; and
  - alkyl or alkenyl substituted by one or more substituents selected from the group consisting of:
- 15 -OH;
  - halogen;
  - N(R<sub>6</sub>)<sub>2</sub>;
  - CO-N(R<sub>6</sub>)<sub>2</sub>;
  - CS-N(R<sub>6</sub>)<sub>2</sub>;
  - 20 -SO<sub>2</sub>-N(R<sub>6</sub>)<sub>2</sub>;
  - NR<sub>6</sub>-CO-C<sub>1-10</sub> alkyl;
  - NR<sub>6</sub>-CS-C<sub>1-10</sub> alkyl;
  - NR<sub>6</sub>- SO<sub>2</sub>-C<sub>1-10</sub> alkyl;
  - CO-C<sub>1-10</sub> alkyl;
  - 25 -CO-O-C<sub>1-10</sub> alkyl;
  - N<sub>3</sub>;
  - aryl;
  - substituted aryl;
  - heteroaryl;
  - 30 -substituted heteroaryl;
  - heterocyclyl;
  - substituted heterocyclyl;

-CO-aryl;  
-CO-(substituted aryl);  
-CO-heteroaryl; and  
-CO-(substituted heteroaryl);

5       **R<sub>3</sub>** and **R<sub>4</sub>** are independently selected from the group consisting of hydrogen, alkyl, alkenyl, halogen, alkoxy, amino, alkylamino, dialkylamino and alkylthio;

**R<sub>5</sub>** is H or C<sub>1-10</sub> alkyl, or **R<sub>5</sub>** can join with X to form a ring that contains one or two hetero atoms; or when **R<sub>1</sub>** is alkyl, **R<sub>5</sub>** and **R<sub>1</sub>** can join to form a ring;

10      each **R<sub>6</sub>** is independently H or C<sub>1-10</sub> alkyl;  
          or a pharmaceutically acceptable salt thereof.

2.      A compound or salt of claim 1 wherein Y is -CO-.

15      3.     A compound or salt of claim 1 wherein Y is -CO- and Z is a bond.

4.      A compound or salt of claim 3 wherein R<sub>1</sub> is alkyl, aryl or substituted aryl.

5.      A compound or salt of claim 1 wherein Y is -CS-.

20      6.     A compound or salt of claim 1 wherein Y is -CS- and Z is a bond.

7.      A compound or salt of claim 6 wherein R<sub>5</sub> is H and R<sub>1</sub> is aryl or substituted aryl.

25      8.     A compound or salt of claim 1 wherein R<sub>5</sub> is H.

9.      A compound or salt of claim 1 wherein Z is a bond.

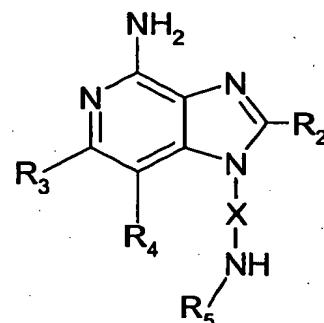
10.     A compound or salt of claim 9 wherein R<sub>1</sub> is alkyl, aryl, or substituted aryl.

30      11.    A compound or salt of claim 10 wherein R<sub>1</sub> is alkyl.

12. A compound or salt of claim 1 wherein R<sub>5</sub> is alkyl and R<sub>1</sub> is alkyl.
13. A compound or salt of claim 1 wherein R<sub>2</sub> is H, alkyl or alkyl-O-alkyl.
- 5 14. A compound or salt of claim 1 wherein X is -(CH<sub>2</sub>)<sub>2-4</sub>-.
15. A compound or salt of claim 1 wherein R<sub>3</sub> and R<sub>4</sub> are independently H or alkyl.
16. A compound or salt of claim 1 wherein R<sub>3</sub> and R<sub>4</sub> are both methyl.
- 10 17. A compound selected from the group consisting of:  
*N-[4-(4-Amino-2-butyl-6,7-dimethyl-1H-imidazo[4,5-c]pyridin-1-yl)butyl]benzamide;*  
*N-[4-(4-Amino-2-butyl-6,7-dimethyl-1H-imidazo[4,5-c]pyridin-1-yl)butyl]-4-[(2-(dimethylamino)ethoxy](phenyl)methyl]benzamide;*
- 15 *N-{4-[4-amino-2-(ethoxymethyl)-6-methyl-1H-imidazo[4,5-c]pyridin-1-yl]butyl}-2-methylpropanamide;*  
*N-[4-(4-amino-6,7-dimethyl-1H-imidazo[4,5-c]pyridin-1-yl)butyl]acetamide;*  
*2-(ethoxymethyl)-1-[2-(1-isobutyrylpiperidin-4-yl)ethyl]-6,7-dimethyl-1H-imidazo[4,5-c]pyridin-4-amine;*
- 20 *N-[3-(4-amino-2,6,7-trimethyl-1H-imidazo[4,5-c]pyridin-1-yl)propyl]acetamide;*  
*N-[3-(4-amino-2,6,7-trimethyl-1H-imidazo[4,5-c]pyridin-1-yl)propyl]-2-methylpropanamide;*  
*N-{3-[4-amino-2-(ethoxymethyl)-6,7-dimethyl-1H-imidazo[4,5-c]pyridin-1-yl]propyl}acetamide;*
- 25 *N-{3-[4-amino-2-(ethoxymethyl)-6,7-dimethyl-1H-imidazo[4,5-c]pyridin-1-yl]propyl}-2-methylpropanamide;*  
*N-[2-(4-amino-2,6,7-trimethyl-1H-imidazo[4,5-c]pyridin-1-yl)ethyl]acetamide;*  
*N-[2-(4-amino-2,6,7-trimethyl-1H-imidazo[4,5-c]pyridin-1-yl)ethyl]-2-methylpropanamide;*
- 30 *N-{2-[4-amino-2-(ethoxymethyl)-6,7-dimethyl-1H-imidazo[4,5-c]pyridin-1-yl]-1,1-dimethylethyl}acetamide;*

- N*-{2-[4-amino-2-(ethoxymethyl)-6,7-dimethyl-1*H*-imidazo[4,5-*c*]pyridin-1-yl]-1,1-dimethylethyl}benzamide; and  
N-[4-(4-Amino-6,7-dimethyl-1*H*-imidazo[4,5-*c*]pyridin-1-yl)butyl]-4-[[2-(dimethylamino)ethoxy](phenyl)methyl]benzamide;
- 5 N-[4-(4-amino-6,7-dimethyl-2-propyl-1*H*-imidazo[4,5-*c*]pyridin-1-yl)butyl]acetamide;  
or a pharmaceutically acceptable salt thereof.
18. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 in combination with a pharmaceutically acceptable carrier.
- 10 19. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 2 in combination with a pharmaceutically acceptable carrier.
20. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 17 in combination with a pharmaceutically acceptable carrier.
- 15 21. A method of inducing cytokine biosynthesis in an animal comprising administering a therapeutically effective amount of a compound of claim 1 to the animal.
- 20 22. A method of treating a viral disease in an animal comprising administering a therapeutically effective amount of a compound of claim 1 to the animal.
- 25 23. A method of treating a neoplastic disease in an animal comprising administering a therapeutically effective amount of a compound of claim 1 to the animal.
24. A method of inducing cytokine biosynthesis in an animal comprising administering a therapeutically effective amount of a compound of claim 2 to the animal.
- 30 25. A method of treating a viral disease in an animal comprising administering a therapeutically effective amount of a compound of claim 2 to the animal.

26. A method of treating a neoplastic disease in an animal comprising administering a therapeutically effective amount of a compound of claim 2 to the animal.
27. A method of inducing cytokine biosynthesis in an animal comprising  
5 administering a therapeutically effective amount of a compound of claim 17 to the animal.
28. A method of treating a viral disease in an animal comprising administering a therapeutically effective amount of a compound of claim 17 to the animal.
- 10 29. A method of treating a neoplastic disease in an animal comprising administering a therapeutically effective amount of a compound of claim 17 to the animal.
30. A compound of the formula (II):



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wherein: X is alkylene or alkenylene;  
R<sub>2</sub> is selected from the group consisting of:

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- hydrogen;
- alkyl;
- alkenyl;
- aryl;
- substituted aryl;
- heteroaryl;
- substituted heteroaryl;
- alkyl-O-alkyl;

25

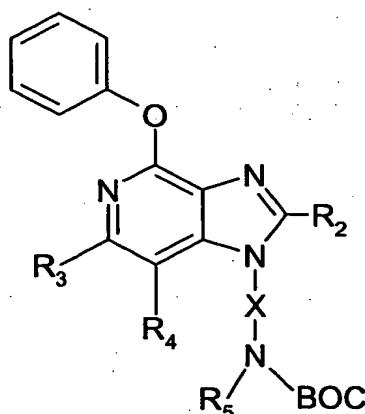
- alkyl-S-alkyl;  
-alkyl-O-aryl;  
-alkyl-S-aryl:  
-alkyl-O- alkenyl;  
-alkyl-S- alkenyl; and  
-alkyl or alkenyl substituted by one or more substituents selected  
from the group consisting of:  
-OH;  
-halogen;  
-N(R<sub>6</sub>)<sub>2</sub>;  
-CO-N(R<sub>6</sub>)<sub>2</sub>;  
-CS-N(R<sub>6</sub>)<sub>2</sub>;  
-SO<sub>2</sub>-N(R<sub>6</sub>)<sub>2</sub>;  
-NR<sub>6</sub>-CO-C<sub>1-10</sub> alkyl;  
-NR<sub>6</sub>-CS-C<sub>1-10</sub> alkyl;  
-NR<sub>6</sub>- SO<sub>2</sub>-C<sub>1-10</sub> alkyl;  
-CO-C<sub>1-10</sub> alkyl;  
-CO-O-C<sub>1-10</sub> alkyl;  
-N<sub>3</sub>;  
-aryl;  
-substituted aryl;  
-heteroaryl;  
-substituted heteroaryl;  
-heterocyclyl;  
-substituted heterocyclyl;  
-CO-aryl;  
-CO-(substituted aryl);  
-CO-heteroaryl; and  
-CO-(substituted heteroaryl);
- R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of  
hydrogen, alkyl, alkenyl, halogen, alkoxy, amino, alkylamino, dialkylamino and  
alkylthio;

**R<sub>5</sub>** is H or C<sub>1-10</sub> alkyl, or R<sub>5</sub> can join with X to form a ring that contains one or two hetero atoms;

each R<sub>6</sub> is independently H or C<sub>1-10</sub> alkyl;  
or a pharmaceutically acceptable salt thereof.

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31. A compound of the formula (IV):



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wherein: X is alkylene or alkenylene;

R<sub>2</sub> is selected from the group consisting of:

- hydrogen;
- alkyl;
- alkenyl;
- aryl;
- substituted aryl;
- heteroaryl;
- substituted heteroaryl;
- alkyl-O-alkyl;
- alkyl-S-alkyl;
- alkyl-O-aryl;
- alkyl-S-aryl;
- alkyl-O- alkenyl;
- alkyl-S- alkenyl; and

15

20

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-alkyl or alkenyl substituted by one or more substituents selected from the group consisting of:

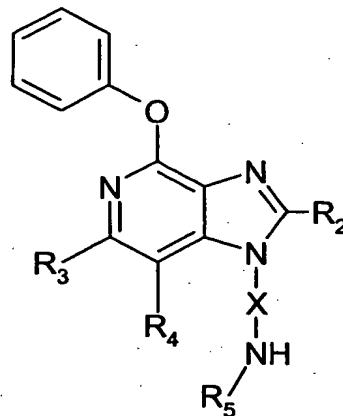
- OH;
- halogen;
- 5 -N(R<sub>6</sub>)<sub>2</sub>;
- CO-N(R<sub>6</sub>)<sub>2</sub>;
- CS-N(R<sub>6</sub>)<sub>2</sub>;
- SO<sub>2</sub>-N(R<sub>6</sub>)<sub>2</sub>;
- NR<sub>6</sub>-CO-C<sub>1-10</sub> alkyl;
- 10 -NR<sub>6</sub>-CS-C<sub>1-10</sub> alkyl;
- NR<sub>6</sub>- SO<sub>2</sub>-C<sub>1-10</sub> alkyl;
- CO-C<sub>1-10</sub> alkyl;
- CO-O-C<sub>1-10</sub> alkyl;
- N<sub>3</sub>;
- 15 -aryl;
- substituted aryl;
- heteroaryl;
- substituted heteroaryl;
- heterocyclyl;
- substituted heterocyclyl;
- 20 -CO-aryl;
- CO-(substituted aryl);
- CO-heteroaryl; and
- CO-(substituted heteroaryl);

25 R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, alkyl, alkenyl, halogen, alkoxy, amino, alkylamino, dialkylamino and alkylthio;

R<sub>5</sub> is H or C<sub>1-10</sub> alkyl, or R<sub>5</sub> can join with X to form a ring that contains one or two hetero atoms;

30 each R<sub>6</sub> is independently H or C<sub>1-10</sub> alkyl;  
or a pharmaceutically acceptable salt thereof.

32. A compound of the formula (V):



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wherein: **X** is alkylene or alkenylene;

**R<sub>2</sub>** is selected from the group consisting of:

10

- hydrogen;
- alkyl;
- alkenyl;
- aryl;
- substituted aryl;
- heteroaryl;
- substituted heteroaryl;

15

- alkyl-O-alkyl;
- alkyl-S-alkyl;
- alkyl-O-aryl;
- alkyl-S-aryl;
- alkyl-O- alkenyl;

20

- alkyl-S- alkenyl; and
- alkyl or alkenyl substituted by one or more substituents selected from the group consisting of:

25

- OH;
- halogen;
- N(R<sub>6</sub>)<sub>2</sub>;

- 5
- CO-N(R<sub>6</sub>)<sub>2</sub>;
  - CS-N(R<sub>6</sub>)<sub>2</sub>;
  - SO<sub>2</sub>-N(R<sub>6</sub>)<sub>2</sub>;
  - NR<sub>6</sub>-CO-C<sub>1-10</sub> alkyl;
  - NR<sub>6</sub>-CS-C<sub>1-10</sub> alkyl;
  - NR<sub>6</sub>- SO<sub>2</sub>-C<sub>1-10</sub> alkyl;
  - CO-C<sub>1-10</sub> alkyl;
  - CO-O-C<sub>1-10</sub> alkyl;
  - N<sub>3</sub>;
- 10
- aryl;
  - substituted aryl;
  - heteroaryl;
  - substituted heteroaryl;
  - heterocyclyl;
  - substituted heterocyclyl;
- 15
- CO-aryl;
  - CO-(substituted aryl);
  - CO-heteroaryl; and
  - CO-(substituted heteroaryl);
- 20
- R<sub>3</sub>** and **R<sub>4</sub>** are independently selected from the group consisting of hydrogen, alkyl, alkenyl, halogen, alkoxy, amino, alkylamino, dialkylamino and alkylthio;
- R<sub>5</sub>** is H or C<sub>1-10</sub> alkyl, or R<sub>5</sub> can join with X to form a ring that contains one or two hetero atoms;
- 25
- each **R<sub>6</sub>** is independently H or C<sub>1-10</sub> alkyl;  
or a pharmaceutically acceptable salt thereof.

30